

SPECIFICATIONS FOR COLD WATER METERS

DISPLACEMENT TYPE

REVISED DECEMBER 2011

1. SCOPE

This specification covers cold-water displacement meters one and one-half inches (1-1/2") and smaller in size designed for waterworks service.

2. GENERAL DESCRIPTION

Water meters to be furnished shall be magnetic drive, sealed register, disc or piston type meters more specifically described in other parts of this specification.

3. GENERAL REQUIREMENTS

- a) Except as otherwise modified or supplemented herein, the latest revision of AWWA Standard C700, "AWWA Standard for Cold-Water Meters - "Displacement Type" shall govern the material, design, manufacture, and testing of all meters furnished under this specification.
- b) The San Antonio Water System reserves the right to limit purchase of meters one and one half inches (1-1/2") or smaller in size to the manufacturers and to the models specified, shown on Attachment I, latest revision, provided such meters conform to the provision contained herein.

4. SPECIFIC REQUIREMENTS

a) Meter Case

The main case shall be solid with removable top or bottom design and will be manufactured of **bronze**. **All meters must meet NSF Standard 61 Certification (internal coating will not be allowed) and carry the NSF 61 mark molded on the housing.** In either case, the top or bottom shall be bolted to the housing. The register box and register cover shall be bronze and sidewalk mounted. The meter shall be so constructed that the main case (including meter spuds) will withstand internal pressure and external stress to eliminate distortion, cracking and breaking, which will cause leakage, damage to other components, or interfere with the proper operation of the meter in general.

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b) **Serial Number**

The serial number of the meter shall be clearly imprinted on the outer case as well as on the register box cover.

c) **Meter Registers**

The meter register shall be a "Sealed Register" type with straight reading indicator with a minimum of six numbered wheels (dials) and shall indicate in cubic feet. All digits shall be black on white background except the right two digits. The right digits shall be white numerals on black background (dials or fixed digits). There shall be a test index circle, which shall be divided into 100 equal parts, each tenth numbered. The index circle shall be located on the outer periphery of the face, equipped with a center sweep test hand. The month the register is manufactured, by year, and size or model shall be stamped or printed clearly on the register face with Arabic numerals. The register shall also have a "low flow" indicator. Registers for given manufacturer, size and like model shall be interchangeable.

As used in these specifications, the term "Sealed Register" shall mean a register that is tamper-proof, factory sealed, non-shop repairable, hermetically sealed against fogging, moisture and corrosion and mechanically disconnected from the measuring components. If the sealed register becomes defective or vandalized, the register will be returned to the manufacturer for repairs or replacement. The manufacturer will hermetically seal all registers repaired or replaced.

The lens shall be of a high strength heat tested glass or impact-resistant glass designed to minimize breakage.

The register shall be secured to the meter case with a tamper-resistant locking device.

d) **Measuring Chamber Assembly**

The measuring chamber shall be made of a suitable polymeric material. All shafts or spindles attached to the disc or piston within measuring chamber shall be made of series 316 stainless steel. The maximum allowed disc nutation or piston oscillations per cubic feet as shown below:

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<u>Size</u>	<u>Maximum Nutation/Oscillations</u>
5/8"	435
3/4"	250
1"	115
1-1/2"	50

e) Strainers

Each meter shall be provided with a stainless steel strainer or strainer of a suitable non-corrosive material. It shall fit snugly in the casing and shall be rigid and easy to remove.

f) Length

<u>Size</u>	<u>Length - Inches</u>
5/8"	7-1/2
3/4"	9
1"	10-3/4
1-1/2"	13

5. ACCURACY

The manufacturer shall guarantee that all new meters will test at least ninety-five percent (95%) accurate at the "low flow" rate and conform to AWWA Manual M6 for accuracy at intermediate and high flow rates on a meter size for size basis.

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**6. TESTS**

- a) The San Antonio Water System reserved the option to test all meters in accordance with AWWA Manual M6. The water temperatures for test purpose will be approximately seventy-seven degrees (77F) and the pressure will be approximately seventy-five (75) psi. All new meters tested on the low flow of 1/4 gpm for 5/8 inch, 1/2 gpm for 3/4 inch, 3/4 gpm for 1 inch, and 1-1/2 gpm for 1-1/2 inch shall test at least ninety-five percent (95%) accurate. If three percent (3%) of the meters tested in each shipment do not meet these quality standards herein will be grounds for rejecting the entire shipment. The manufacturer shall reimburse the San Antonio Water System \$7.50 for each meter that fails this test only. All meters that fail this test, along with the rejected shipment, will be returned to the manufacturer, freight collect and the manufacturer will replace the defective meter(s) with new meter(s), freight prepaid within thirty (30) days from receipt of the defective meter(s).
- b) A tag indicating the factory accuracy test results of the meter on low, intermediate and high flows shall accompany all meters.

**7. GUARANTEES**

- a) The manufacturer shall unconditionally guarantee the 5/8", 3/4" and 1" meters as follows:

The "Sealed Register" unit will operate accurately for a period of fifteen (15) years from the date of receipt.

That the new water meters will perform to new meter accuracy standards of ninety five percent (95%) at low flow for a period of at least one (1) year from date of receipt

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That after one (1) year in service the new meter will meet repaired meter accuracy standards, AWWA Manual M6, latest revision for an additional fourteen (14) years or the following quantities of cubic feet, whichever occurs first:

<u>Meter Size</u>	<u>Registration</u>
5/8"	200,000 cubic feet
3/4"	300,000 cubic feet
1"	400,000 cubic feet

- b) The manufacturer shall unconditionally guarantee the one and one half inch (1-1/2") meter as follows:

That the "Sealed Register" unit will operate accurately for a period of fifteen (15) years from date of receipt.

That the new water meters will perform to new meter accuracy standards under the provisions of AWWA Manual M6, latest revision, for a period of at least one (1) year from date of receipt.

That after one (1) year in service the new meters will meet repaired meter accuracy standards, AWWA Manual M6, latest revision, for an additional nine (9) years or 500,000 cubic feet, whichever occurs first.

- c) Damage caused by vandalism, acts of God or willful or negligent means will be borne by the San Antonio Water System.
- d) If the meter becomes defective (excluding foreign debris causing measuring chamber breakdown) within the time specified in paragraph 7.a and 7.b above, the manufacturer shall reimburse the San Antonio Water System \$14.00 per 5/8", 3/4" & 1" meter and \$46.00 per 1-1/2" meter labor cost to remove the meter from the field. The manufacturer will repair or replace the defective meter according to meter size with a meter that meets the San Antonio Water System's specifications. The defective meter removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the meter, freight prepaid within thirty (30) days from receipt of the defective meters.

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**10. QUALITY SYSTEM**

Manufacturers shall have an I.S.O. 9001: 2000 registered quality systems. If on receipt of meters they are found to be non-compliant the manufacturer shall replace the defective meters according to meter size with a meter that meets the San Antonio Water System's specifications. The defective meters will be returned to the manufacturer, freight collect, and the manufacturer shall replace the meter, freight prepaid within thirty (30) days from receipt of the defective meter. If San Antonio Water System audits, product inspection and performance data review in accordance with these specifications determine excessive meter non-compliance (in excess of 3% annually), the manufacturer will be subject to removal by the Products Standards Committee.

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**Attachment I**

<b><u>Approved Meter Manufacturer</u></b>	<b><u>Model</u></b>	<b><u>Size</u></b>
Badger Meter, Inc	Recordall	5/8" thru 1-1/2"
Elster AMCO Water, Inc	Model C700	5/8" thru 1-1/2"
Neptune Technology	Trident 10	5/8" thru 1-1/2"
Hersey Meters	400 Series II S 500 Series II S	5/8" thru 1" 1-1/2"
Performance Meter Inc.	Nitro II PNPD 02	5/8"

**Previous Specification**

OCTOBER 1995

JUNE 1999

APRIL 2000

MARCH 2003

JANRUARY 2005

JULY 2006

MARCH 2007

AUGUST 2007

DECEMBER 2011